The University of Washington (UW) Information School requests $249,691 for a National Leadership Grant for Libraries (NLG-L) *Project Grant* (aligned with the **Promote Lifelong Learning** goal) to implement a project -- ***Misinformation Escape Room: Supporting Libraries as Hubs for Misinformation Education***. This one-year project will develop and implement a comprehensive program for libraries that aims to foster greater understanding and resilience to misinformation. By building and deploying an online escape room hosted by librarians, we aim to improve libraries' capacity to address misinformation through innovative educational programming. We will deploy a tested escape room prototype in ten public libraries, create a Design Kit that allows libraries to develop other escape rooms, run two Co-Design Camps around Black Lives Matter and Fandom to demonstrate use of the Design Kit for creating interest-driven escape rooms, and undertake a broad dissemination campaign.

A. Statement of National Need

Misinformation[1] has emerged as a foundational threat to democratic society, undermining civic discourse, and tearing at the social fabric. It also represents a frontal challenge to the library profession as one of the core values of the profession is to provide the general public with equitable access to information and promote an informed citizenry. For decades, librarianship has relied on information literacy (IL) theory and practice to support this mission, with many continuing to advocate that "the bulk of disinformation on the Internet could be combated with basic evaluation skills" (Cooke, 2017). One study of library misinformation curricula concludes that most efforts "double down" on the notion that good information seeking practices can mitigate the effects of misinformation (Sullivan, 2019).

Recent years, however, have witnessed a growing chorus questioning this conviction, recognizing the need for more fundamental changes (Fister, 2021; Beene & Greer, 2021; Sullivan, 2019; Lor, 2018). Within the IL field, a recent literature review identified two broad strategies that libraries advocate for information consumers: deferring to authoritative sources, and "recogniz(ing) an emotional-based reaction to fake news in a post-truth world" (Revenz & Corujo, 2021). Some have tied information literacy to checklist approaches (Neeley-Sardon & Tignor, 2018). A content analysis of 21 academic library guides found that each one leveraged checklists to fight fake news (Lim, 2020). IFLA's "How to Spot Fake News" exemplifies this approach.[2] However, other research suggests that the checklist model is outdated (Meola, 2004), with calls for more dynamic literacy education that goes beyond such "reactive resources" (McDougall, 2019).

Arguably the **most critical need is for approaches that incorporate misinformation research from other fields** (Sullivan, 2019). This is particularly the case with regard to the psychological and emotional dimensions of misinformation, including the role of personal beliefs, social identity, emotion, confirmation bias, motivated reasoning, and epistemic beliefs (Lewandowsky, 2019), or the affective and social dimensions of information consumption (Lor, 2018). Misinformation is especially effective because it exploits psychological tendencies and triggers emotional reactions (Pennycook, 2017; Taddicken & Wolff, 2020; Nickerson, 1998; Pennycook & Rand, 2019; Lewandowsky et al., 2012; Ștefăniță et al., 2018). Emotional content increases the virality of social media postings (Berger & Milkman, 2012; Bail, 2016). Anger makes people more defensive and partisan, while anxiety lowers people's defensives, making them more vulnerable to misinformation from the other party (Weeks, 2015). Negative emotions impact critical evaluation of evidence, and on the contrary, positive emotions support self-determination regarding critical evaluation of evidence (Darner, 2019).

Another need is to **incorporate a more thorough understanding of how misinformation works**,

[1] This proposal uses the term "misinformation" to also encompass "disinformation" to avoid repeating the cumbersome "mis- and disinformation" term. Technically, misinformation refers to false or inaccurate information, while disinformation is the sharing of misinformation with the intent to deceive.

[2] www.ifla.org/publications/node/11174

drawing on frameworks such as *Information Disorder: Toward an interdisciplinary framework for research and policy making* (Wardle & Derakhshan, 2019 - note: Wardle is an Advisory Board member for this project). This extensive framework covers distinctions between types of misinformation (mis-information, dis-information, mal-information), the phases of information disorder (creation, production, and distribution), and numerous other critical concepts. Additionally, PI Coward has advocated that we need to open the black box to learn about the specific technologies and tactics used to spread misinformation (e.g., social media bots, deepfakes, algorithmic targeting) (Coward, 2020).

To further understand the experiences of librarians, PI Coward and colleagues conducted interviews of librarians in Washington State, confirming a strong desire for new approaches to misinformation education (Young et al., 2020). Librarians acknowledged the lack of their own professional preparation and knowledge to confidently help patrons. They also offered many suggestions for programs that: (1) appeal to a broader audience, as existing programs mostly attract already concerned citizens and not people who might be more susceptible to misinformation; (2) embed misinformation within topics of community interest, not stand-alone "misinformation" programs; and (3) are engaging and interactive, going beyond "how to" type tutorials (Gordon et al., 2011). These and other comments also demonstrated that librarians possess a nuanced understanding of how their patrons are grappling with misinformation, a critical asset for introducing new programs that complement their knowledge and skills in supporting community needs. Anecdotally, our Center for an Informed Public (CIP), of which PI Coward is a co-Founder, frequently receives requests from librarians, educators, and others for new misinformation educational resources.

This proposal *addresses these needs* by introducing an online escape room as an effective game-based format for active learning about misinformation. Escape rooms are live interactive adventure games in which a team of players (e.g., 4-8) work cooperatively to solve puzzles in a set amount of time (e.g., 1 hour). A worldwide phenomenon, they are also popular in public libraries where they have been deployed to offer STEM learning, curriculum support in partnership with schools, and information literacy instruction, in addition to entertainment value (Kroski, 2019). Importantly, escape rooms are immersive and interactive environments that can be designed to elicit the types of psychological and emotional reactions that make misinformation so pernicious. A game further enables participants to step into a magic circle that provides permission to play towards mastery - and *fail safely* - an attribute not present in more conventional forms of misinformation education (Salen & Zimmerman, 2004). This is particularly important given the politically charged nature of misinformation. Finally, an escape room is a group experience, allowing for the social dimension of misinformation to be replicated.

The literature on serious games is extensive, with games on misinformation beginning to emerge. Examples include the online games *Bad News* and *Harmony Square* and the card game *Lamboozled.*[3] Research on these games shows positive outcomes on various dimensions of misinformation awareness and resilience (Roozenbeek & Linden, 2020; Clever et al., 2020). The proposed project will add new knowledge to this literature, as well as to information literacy theory and pedagogy. Additionally, the online escape room format will make a contribution to the growing need for virtual library programming in a post-pandemic era.

B. Project Design

1. Goals

- Finalize development of an online escape room that produces observable learning outcomes around misinformation
- Enable and pilot the creation of new escape rooms through the development of a misinformation escape room Design Kit and implementation of two Co-Design Camps

[3] See www.getbadnews.com, www.harmonysquare.game & www.lamboozled.com

- Achieve broad uptake of the escape rooms through a dissemination campaign

2. Current work

This proposal builds on a highly promising pilot project that has produced a tested online escape room prototype and seeks to both finalize it for broad distribution and extend the work by developing a misinformation escape room design kit and producing new escape rooms.

With startup funding from the UW's Center for an Informed Public (CIP) and Technology & Social Change Group (TASCHA), the research team started development of an online (due to the pandemic) escape room in Spring 2020 with a class of MLIS, undergraduate and PhD students and the co-founder of Puzzle Break, the first US-based escape room and a leading designer of escape rooms nationally. Responding to the gaps in misinformation education stated above, our primary focus was the *affective dimensions of misinformation*. We wanted to elicit feelings of vulnerability, challenge people's preconceived notions, and cause people to reflect on the consequences of spreading misinformation. We also aimed to create awareness of common technologies and tactics, such as misleading charts, social media bots, AI-generated images, and deepfake videos. We elected to create a fictional theme that avoids mention of polarizing and alienating terms such as "misinformation" and "fake news" to appeal to a broad and diverse public, as suggested by librarians in our study. Our work has further been informed by field-leading misinformation research from CIP,[4] as well as research on mixed reality games and game related co-design work by the UW GAMER Group[5].

In Fall 2020, we completed a fully functional prototype -- *The Euphorigen Investigation* -- and created an external facing website -- *Loki's Loop* -- to host it and future escape rooms.[6] In gameplay, a librarian hosts the escape room over Zoom, leading players through the escape room narrative and offering hints as needed. Players interact with each other as they collaboratively solve the puzzles. The session ends with a 15 minute debrief interview with the librarian. Game literature shows that an opportunity to reflect on an experience and put it into a non-play context is when most learning happens (Clark et al., 2013).

In Winter 2021, we piloted *Euphorigen* in six Washington State public libraries. Each library hosted three sessions of the escape room, for a total of 18 sessions. We video-recorded the gameplay and debrief group interviews and administered participant surveys. We also held a focus group discussion with the librarians at the conclusion of the pilot study to capture their perspectives and suggestions for improvement. While data analysis has just begun, we see promising preliminary indications that we are achieving the game's learning goals. The following quotes are taken from the participant survey:

> *I was struck by how quick I was to think the game was over when we found the "deep fake." It matched what I expected to find, so I didn't think any more about it.* ***I did think later about how often I might do that in my real life.*** *I actively try to stop myself from just reinforcing my own beliefs, but it's human nature, I think.*
>
> *It pointed out to me how my bias might affect how I receive certain kinds of information.* ***I didn't realize the level of sophistication and trickery that goes into spreading misinformation - my tendency is to think that people who are susceptible to misinformation are either not very intelligent or educated****, but I think that feeling comes from people believing in some of the more outlandish ideas out there.*
>
> *I was aware of misinformation, especially misinformation from bot accounts and misleading representations of data.* ***This exercise helped give me more knowledge to combat this misinformation, allowing me to identify it and thus become less susceptible to it****.*

[4] www.cip.uw.edu/research/#publications

[5] Kim et al., 2020; Lee et al., 2020, Bhattacharya et al., 2019, and more (https://gamer.ischool.uw.edu/publications/)

[6] https://www.lokisloop.org

*For me, it was a reminder that **a lot of things online can be fake no matter how you think about it and you really have to check for evidence if it's true or not**. **I can unintentionally spread misinformation** (even if it's good) and won't find out or I could face consequences.*

3. Project Activities

This project consists of six main activities: (1) Finalize development of *Euphorigen* and create implementation package, (2) Deploy *Euphorigen* in 10 public libraries and collect evaluation data, (3) Develop a misinformation escape room Design Kit, (4) Run two Co-Design Camps and produce community interest-driven escape rooms, (5) undertake a robust evaluation, and (6) implement a broad dissemination campaign.

Activity #1: Finalize Development of Euphorigen Escape Room and Create Implementation Package

The aim of this activity is to incorporate findings from our current pilot project to finalize *Euphorigen* and develop an implementation package that includes: recruitment materials, training materials, gamehost guides, debrief guides, and other misinformation learning resources.

Our current pilot project has generated exploratory evaluation data on (a) game design/usability/ enjoyability, (b) our misinformation learning goals, and (c) fit for library programming and librarian roles. In Spring 2021 we will analyze this data so that we are prepared to incorporate the findings at the start of the proposed project in Fall 2021. From our early look at the data, we see opportunities to improve the aesthetics for increased sense of immersiveness, add more functionality to support the collaborative gameplay, and make adjustments to the narrative (e.g., multiple branches) to more effectively achieve the learning goals. For library fit, we received detailed feedback from the librarians for improving overall implementation (e.g., promotion, scheduling) and supporting patron learning (e.g., provide resources for further learning).

For this activity, we will begin by presenting the results of the Winter 2021 pilot study to the Advisory Board for their feedback. The PIs will create a research class to enroll students in the project and, together with our Puzzle Break collaborator, make the final changes to *Euphorigen* in Q1. We will also make ongoing improvements to the implementation resources, in Q1 and based on the pilot, and again in Q3 based on the results of deploying Euphorigen in 10 libraries (Activity #2). We will engage WebJunction, our recruitment and dissemination partner, in this process to gain their expertise and further professionalize and package the resources for broad distribution.

Activity #2: Deploy Euphorigen in 10 Public Libraries and Collect Evaluation Data

The aim of this activity is to deploy *Euphorigen* in 10 libraries and collect data that can be used to make further improvements to *Euphorigen* and contribute new knowledge around misinformation education, information literacy, mixed reality games for social good, and online library programming.

In Q1 we will conduct a nationwide open recruitment and interview finalists based on their applications and fulfillment of our diversity criteria: geographic (urban/rural), ideological (liberal/conservative), and racial/ethnic (BIPOC and other non-dominant populations). Our partner, WebJuction, will lead this recruitment effort based on successful prior experience with its Small Libraries Create Smart Spaces project.[7] The other advantage of an open recruitment is the opportunity to identify libraries that are often overlooked in projects of this sort. We also have extensive relationships and interest in this project, including from the six pilot libraries (from urban and rural Washington State), large urban libraries (Seattle Public Library, New York Public Library, Chicago Public Library), small and rural libraries (from the Information School's ConnectedLib project IMLS #RE-246317-OLS-20), and library associations (e.g., PLA, ARSL).

[7] https://www.webjunction.org/explore-topics/smart-spaces.html

In Q2 we will provide training and implementation resources to the selected 10 libraries. Each library will run 6 sessions of the escape room, for a total of 60 sessions. This will generate robust data for assessing the escape room's impact on people's understanding of and resistance to misinformation, as well as informing final improvements to *Euphorigen*. Librarian time commitment is approximately 15 hours and includes training, logistics, communications, and post-experience focus group discussion.

Activity #3: Develop Misinformation Escape Room Design Kit

The aim of the Design Kit is to enable modification of *Euphorigen* and the creation of new misinformation escape rooms with different puzzles and narratives. The Design Kit also forms the basis for the Co-Design Camps in Activity #4.

The Design Kit will exist as a digital platform with the functionality for users to create their own misinformation escape rooms with their own narratives. This includes selecting and sequencing puzzle types, creating and uploading objects (e.g., charts, images, and video), adding text, and incorporating aesthetic elements. The Design Kit will also allow Euphorigen to be translated into other languages, a desire expressed by librarians who participated in the prototype testing.

We will begin by making *Euphorigen's* existing digital puzzles editable and deconstructing the escape room into its composite parts. We developed *Euphorigen* with this ultimate goal in mind to ease the technical development time required for this component. We will then create additional puzzle types representing other types of misinformation and assemble everything into a simple-to-use format. The participants in the Co-Design Camps will create their own narratives, relevant to their respective communities, to accompany the puzzles for increased immersiveness. The goal is for the Design Kit to be usable by people with varying digital literacy skills. This project will generate the experience needed to keep refining and making it easier to use.

Development of the Design Kit will primarily occur in Q1 and Q2 with a team of students in our Informatics program. In Q3 it will go through two iterations after each Co-Design Camp (Activity #4), with the final version ready for broader deployment in Q4.

Activity #4: Run Two Co-Design Camps and Produce Community Interest Driven Escape Rooms

The aim of this activity is to run two Co-design Camps with specific communities and produce new misinformation escape rooms that can be broadly shared.

For this activity we have selected -- **ARMY Fandom** and **Black Lives Matter** (BLM) -- areas with which we are familiar through the GAMER Research Group and Center for Informed Public. We will work with librarians and individuals active in these communities, thereby demonstrating how libraries can use the Design Kit to create escape rooms that are driven by community interests.

Black Lives Matter (BLM). Misinformation has targeted the Black-identified community in profound ways. Many people involved in BLM have witnessed this firsthand. #YourSlipIsShowing was one of the first Black-led efforts to call attention to and combat disinformation circulating in BLM networks (Hampton, 2019). Our Center for an Informed Public has documented disinformation campaigns targeting BLM, first by Russian agents leading up to the 2016 presidential election (Arif, Stewart, & Starbird, 2018) and subsequently by domestic groups in the 2020 election cycle, complementing other research on the topic (Freelon et al., 2020).

The experiences of Black people involved in BLM and documentation from research offer extensive cases that can be used for creating an escape room that supports the Black community's efforts to learn about and better resist misinformation. It does so by offering an opportunity for Black people to create *their stories* about how misinformation targets their community, while also helping to increase awareness for everyone.

ARMY Fandom. *Fandom* is a community of people who share a common passion. It's also included in ALA's Future of the Library Trends Report as an increasingly important community to consider for library programming (ALA, 2014). Numerous resources have been developed on how to plan fandom related

programs and events in libraries (e.g., Alessio et al., 2017). Fandom presents an interesting case for studying how people encounter and deal with misinformation in an everyday context. The music group BTS's fandom, called ARMY, in particular, makes an excellent community to work with to co-design a misinformation escape room. ARMY fandom is considered to be one of the largest pop music fandoms today and is also known for its diversity, presence, and impact[8]. ARMYs are known for their dominance in social media and their effectiveness in mobilizing for various collaborative efforts, not only to support BTS (e.g., breaking record for most YouTube views in the first 24 hours for the single "Dynamite" with 101.1 million views), but also to promote numerous social causes (e.g., the #MatchAMillion campaign raised more than one million USD for the BLM movement in one day) (Lee & Nguyen, 2020). Being extremely active and powerful on social media suggests that they are not only exposed to misinformation that is abundant in social media but there is also a chance that other parties may attempt to manipulate information to use the influence of the fandom for financial or political reasons. In fact, prior research (Park et al., 2021) found that there is a substantial amount of mis- and disinformation present in the ARMY fandom, thereby increasing the likelihood that fans would have engaged with this information in their social media usage. Due to the size and diversity of the fandom, designing an escape room that reflects their context and thus, appeal to the fans, could potentially have a huge impact on our project's outreach.

Each **Co-Design Camp** will include two lead librarians and 10 individuals from the general public. In Q1 we will recruit the two lead librarians for each camp through the connections of the PIs. For the BLM camp we will engage Amita Lonial, Assistant Library Director at Tacoma Public Library and co-founder of Libraries4BlackLives,[9] who has offered to help identify the appropriate librarians. The composition of the camp will be predominantly Black-identified, with a small number of non-Black anti-racism activists as well. For the other camp, ARMY Fandom is a community in which Co-PI Lee is well embedded and has led multiple research projects with successful input and engagement from community members (Lee & Nguyen, 2020; Park et al., 2021). We plan to reach out to several sub-communities within the ARMY fandom that are involved in informing and supporting other fans.

In Q2 we will develop the camp curriculum based on participatory design principles (Drain & Sanders, 2019), engaging the four librarians (two for each camp) and advisory board members. Currently, the camp is envisioned as an online program over 10-15 hours. The Q2 planning period will determine the appropriate structure, from a weekend hackathon style program to several sessions spread out over weeks. Topics for the camp include: orientation, *Euphorigen* gameplay and discussion, misinformation related to each area (BLM and Fandom), narrative and puzzle development, and prototype presentation for review.

The review step is needed to ensure the content of each escape room is accurate and appropriate for library audiences. The review team will consist of the PIs, the Advisory Board, and Center for an Informed Public faculty and postdoctoral fellows. This experience will be critical for developing policies and decision-making procedures for the eventual distribution of the Design Kit and Co-Design Camp curriculum, and for hosting the escape rooms on the Loki's Loop website.

In Q2 we will also begin recruiting 10 individuals for each camp, led by the two lead librarians respectively. This allows the librarians to engage patrons who have been active in other library programs, while also offering the flexibility to identify other individuals, since the camps will be offered online.

In Q3 we will run the two camps. This will be done sequentially to allow us to make adjustments to the curriculum between camps. Camp participants will be compensated ensuring consistent participation.

After the review, the project team will perform any remaining technical tasks to ready the escape rooms for distribution. This includes the work needed to host the escape rooms on Loki's Loop.

[8] https://www.btsarmycensus.com/

[9] https://www.libraryjournal.com/?detailStory=public-librarians-launch-libraries4blacklives

The time commitment for the lead librarians is approximately 20 hours (6 hours for developing the Camp curriculum, 10-15 hours for the Co-Design Camp, and 2 hours for post camp debrief). Lead librarians and camp participants will be compensated.

Activity #5: Undertake a Robust Evaluation

We will undertake a comprehensive evaluation of *Euphorigen*, as well as a process evaluation of the Co-Design Camps. An outcomes evaluation will contribute to general knowledge about the game-based approaches to misinformation pedagogy. An ongoing process evaluation will inform the iterative development of the Design Kit and Co-Design Camp curriculum.

The outcomes evaluation of the *Euphorigen* escape room will determine the effectiveness of the escape room by measuring the following:

- Does the escape room improve players' understanding of how misinformation works, including such technologies and techniques as: misleading data, computer-generated images, social media bots, and deepfake videos?
- Does the escape room generate reflection on the affective dimension of misinformation, focused on the psychological and emotional elements embedded in *Euphorigen*?
- Does the escape room change people's attitudes towards misinformation and potential social media behaviors when engaging with problematic information?

These questions will be measured with a pre- and post-survey that will be given to all game players, and focus group discussions with randomly selected players. We will develop specific indicators to assess knowledge of misinformation, attitudes about misinformation, and reflection on misinformation. Analysis will look at dimensions of age, gender identity, race and ethnic identity, ideology, and education to understand any differences that might exist.

The process evaluation will examine how the game is meeting expectations of librarians and individuals involved in the Co-Design Camps and how the camps are aligning with those expectations and stated learning goals. We want to understand the level and nature of involvement of the librarians and individuals engaged in the escape room co-design process and challenges that might arise in engaging certain populations in the work. We will assess the capacity of library staff to facilitate such processes and models of sustainability of resulting curriculum resources and documentation that emerge. Specifically, we will ask:

- What are the design implications for the Design Kit and the Co-Design Camps based on the co-design experience in the two communities?
- What are the design implications for ongoing misinformation escape room development?Does focusing on specific areas (BLM and ARMY Fandom) generate increased levels of engagement and interest with and within relevant communities?
- Does the escape room support the roles of librarians and libraries in providing education on misinformation?

Methods for the process evaluation will include observations of Co-Design Camps, focus groups with librarians and participants, and selected one-on-one interviews to address questions as they arise. Also, the same survey used in the outcomes evaluation will be administered to Co-Design Camp participants as a means of understanding whether knowledge, attitudes, and behaviors are enhanced through the co-design process. If, indeed, the more intensive act of co-designing a misinformation escape room produces significantly greater impacts, then that should inform how libraries consider the additional effort of creating community-driven escape rooms.

Evaluation results will be used throughout the project. The assessment of *Euphorigen* in Q2 will be used to make final changes to the game and library implementation resources in Q3 for the broad

dissemination campaign in Q4. The Co-Design camps will occur sequentially in Q3 to allow for the process evaluation to guide modifications to the curriculum and the Design Kit between the two camps and after the second one.

Activity #6: Implement a Broad Dissemination Campaign

We will partner with WebJunction to: (1) Recruit libraries for the Euphorigen deployment, (2) create a set of resources (escape room hosting guide, video training tutorial, templates for community outreach, etc.), and (3) conduct an outreach campaign to publicize and facilitate uptake of *Euphorigen* and other outputs. This effort will include hosting webinars promoting the project through WebJunction's extensive communication channels. The resources and programming developed will include tips and stories from library staff who have participated in the project.

The project team too will use its networks to publicize and run demonstrations of the escape rooms. Already, the team has run *Euphorigen* at MozFest,[10] with Next Library and other events on the calendar. The proposed project offers extensive opportunities to present at library conferences, to write articles for practitioner journals, and to engage the field through various listservs and other communication channels.

The external facing website, Loki's Loop, was designed specifically to facilitate uptake by the library community and other stakeholders. Currently it houses *Euphorigen,* and with the proposed project the site will be expanded to include the two additional escape rooms, Design Kit, and Co-Design Camp curriculum. These resources will be access-controlled for libraries, archives, and museums (LAM) to protect the integrity of the project and not allow these resources to fall into the hands of individuals and groups that may want to use them to advance harmful misinformation agendas. The general public will be able to engage with and benefit from the project materials via the LAM-only access.

Our Communications teams at the Information School, Center for an Informed Public, and Technology & Social Change Group will publicize the project through its various channels and networks. We have an exceptional record of engagement with public, practitioner, and academic audiences.

Finally, for the academic community we will use the results from the evaluation to write articles and present at conferences. This project contributes to research on information literacy theory and pedagogy, game appeals and mixed reality games applied in a civic context, and virtual library programming.

4. Research Team and Collaborators

We have assembled a project team with exemplary skills, experience, and accomplishments related to the proposed work. Their commitments to the project will ensure that our project outcomes are of the highest quality and will be widely adopted by public libraries from multiple regions.

The PIs (Chris Coward and Jin Ha Lee) and Puzzle Break partner (Lindsday Morse) have collaborated over the past year on the pilot project, including extensive student participation. The project coordinator (Stacey Wedlake) has provided project support for public library research projects since 2012. The evaluator (Eric Gordon) has extensive experience in developing and evaluating games for civic purposes as director of the Engagement Lab at Emerson College.

Team members have all been deeply engaged in public library research for numerous years. Their work typically involves collaboration with public libraries (including the pilot project), providing us with the necessary knowledge of library operating environments. Partner WebJunction further ensures the project will successfully recruit libraries, package resources, and conduct outreach for broad uptake of the final product.

The Advisory Board offers invaluable expertise across a range of domains critical to the success of this project. They are: **June Ahn**, Associate Professor, University of California, Irvine, School of Education (*learning environments, STEM, games, youth*); **Candace Epps-Robertson**, Assistant Professor, English and Comparative

[10] https://schedule.mozillafestival.org/session/BTXPQE-1

Literature, University of North Carolina at Chapel Hill (*cultural rhetoric, literacy, citizenship, resistance, pedagogy*); **Barbara Fister**, Scholar-in-Residence, Project Information Literacy (*information literacy, student learning, algorithmic information systems, crime fiction*); **Risa Puno**, Artist (*Privilege of Escape installation*); **Juan Rubio**, Digital Media and Learning Program Manager, Seattle Public Library (*educational technology, digital media, library programming*), and **Claire Wardle**, Co-founder, First Draft News (*misinformation, social media, communications theory, journalism*).

We will convene the Advisory Board virtually four times: September 2021 (orientation, overall feedback), January 2022 (review Design Kit), April 2022 (review Euphorigen data and first Co-design Camp), July 2022 (review final draft deliverables). Additionally, we will engage individual members to solicit input on aspects associated with their particular areas of expertise (highlighted above).

5. Target Community

There are several target communities, all of whom we engage throughout the project.

Youth and adult services librarians: We will involve librarians throughout the project. We interviewed several librarians when developing *Euphorigen*, and in the current pilot project, we are drawing on the experiences and expertise of the participating librarians to inform modifications to the escape room and instructions for implementing it as a library program. We will involve librarians in a similar fashion for the proposed project, including 10 librarians who will run Euphorigen and 4 librarians who will help create and run the BLM and ARMY Fandom Co-Design Camps.

Black-identified and **Fandom** community members: We will engage 20 individuals (10 from each) in two Co-Design Camps. By design their experiences and perspectives will guide the creation of the new escape rooms. The plan is to make the final products available to libraries nationwide so that they can run the escape rooms for other members of these communities.

General public: We designed *Euphorigen* to appeal to the broad public, especially those most vulnerable to misinformation. By analyzing participant data from 60 sessions (up to 240 people), we will be able to incorporate findings into making final changes to *Euphorigen*.

6. Pandemic contingency

We anticipate no risks to the project from any continuing pandemic-based constraints. Euphorigen is currently being implemented successfully online and the research team has deep experience running online co-design sessions from previous projects such as "Supporting Intergenerational Participatory Design Groups for Librarians and Youth for Design Thinking Around Digital Learning" (LG-96-18-0041) funded by IMLS.

C. Diversity Plan

This project is keenly attentive to diversity throughout all phases and activities. First, we will select participating libraries through an open recruitment process to assure geographic (urban/rural), ideological (liberal/conservative) and racial/ethnic diversity. We will also pay close attention to the diversity of the co-design teams. The BLM Co-Design Camp will be composed of Black-identified people that centers the experiences of Black people and is intended to produce an escape room that appeals to the broad Black community. The Fandom community, too, is diverse in terms of geographic and racial/ethnic diversity.[11] Our Advisory Board has several Black-identified, other minority, and women representatives.

Additionally, we were very intentional in design decisions for *Euphorigen*, for instance, by including people of various races in the image puzzles, having a Black person play the role of the respected medical professional, and using names of multiple cultural origins.

[11] https://www.btsarmycensus.com/results

D. National Impact

Misinformation is a national (and global) phenomenon that presents a fundamental challenge to the public library field. Misinformation, with its increasingly sophisticated tactics, exploits people's vulnerabilities in ways that traditional information literacy approaches are ill suited to counteract on their own. Approaches that better incorporate misinformation research from other fields are critical. Based on our pilot results, we are now well positioned to extend it in exciting ways through the Design Kit and Co-Design Camps. **The proposed project can both fill a tremendous need for new misinformation programming and contribute to ongoing efforts to rethink and improve information literacy theory and practice**. The project further leverages the expertise of librarians, who are ideally positioned to serve as game masters and discussion leaders on misinformation.

This escape room project is adaptable to local contexts. After playing *Euphorigen*, librarians can lead discussions on misinformation tailored to individual and community experiences. The Design Kit will allow any library to run co-design camps and produce new interest-driven escape rooms.

As a digital project, the escape rooms can be improved and modified. The Design Kit allows for limitless narrative variations, and new puzzles that address other misinformation tactics can be added. Adding other languages is straightforward. It further allows communities of librarians from different geographies to collaborate. The BLM and Fandom co-design sessions aim to demonstrate this.

The project further contributes to re-envisioning virtual programs in a post-Covid era. In this case, the project is offered digitally, involving real time engagement among individuals with librarians in a community, a combination that centers the unique role of libraries.

The project is also appealing to other institutions. One of the libraries in our current pilot has teamed up with a local high school to offer the escape room in its classes. The UW's Center for an Informed Public (CIP) has extensive school outreach activities, including an annual MisInfo Day. First held on the University of Washington campus in 2019, in 2021 MisInfo Day was offered nationally with participation from school districts in 13 states.[12] The escape room is ideally suited for inclusion in this growing national event. We have also received interest from museums; the Pacific Science Center, an independent, non-profit science center in Seattle, tested and is excited to offer the escape room in its programming, complementing another digital CIP-produced project, *Facts in the time of Covid-19*.[13]

Escape rooms began as physical installations, and pop-up versions in public libraries have been extremely popular. Another extension of the project could be to turn *Euphorigen* into a physical room for in-library deployment or loaned out for in-home use. Furthermore, the co-design camps can be offered physically with the materials produced by this project.

Euphorigen, the two new escape rooms, the Design Kit and the Co-Design Camp curriculum will all be freely accessible to public libraries worldwide on Loki's Loop. Our hope is to foster a community of interested librarians to develop many new escape rooms and generate data on their use for ongoing research and development purposes. The partnership with WebJunction ensures project visibility and sustainability. The PIs are further committed to pursuing additional funding, viewing this as a highly exciting area of research and development.

Finally, the proposed project will further inform information literacy theory and practice by documenting the needs of diverse populations around misinformation and in public library contexts, providing an updated understanding of how communities perceive misinformation and how new methods for combating it, such as gameplay, can be integrated into libraries' public engagement plans.

[12] www.cip.uw.edu/2021/03/11/misinfoday-2021/

[13] https://view.genial.ly/5eea3a0c15e1e60d88c5c4d0/interactive-content-facts-in-the-time-of-covid-19

National Leadership Grants For Libraries – Project Grant – Promote Lifelong Learning Log Number: LG-248661-OLS Misinformation Escape Room: Supporting Libraries as Hubs for Misinformation Education

Schedule of Completion					
		2021-2022			
ACTIVITY	**TASK**	Autumn	Winter	Spring	Summer
Activity #1	***Finalize Development of Euphorigen and Create Implementation Package***				
Finalize Euphorigen	Derive design implications from Euphorigen play session data				
	Produce interim and final Euphorigen product				
Develop instruments & resources	Develop evaluation methods and instruments				
	Update training and implementation resources				
Activity #2	***Deploy Euphorigen in 10 Public Libraries and Collect Evaluation Data***				
Recruit & training librarians	Recruit 10 library partners to run Euphorigen, ensuring diversity criteria				
	Onboard libraries with implementation resources and provide training				
Collect Euphorigen data	Deploy Euphorigen and collect data on 60 sessions through 10 library partners				
Analyze Euphorigen data	Analyze the collected Euphorigen data				
	Write up findings				
Activity #3	***Develop Misinformation Escape Room Design Kit***				
Develop Design Kit	Develop the first prototype of design kit				
	Pilot test and iterate to create the final design kit based on Co-Design Camps				
Activity #4	***Run Two Co-Design Camps and Produce Community Interest Driven Escape Rooms***				
Design the Fandom Escape Room	Recruite the co-design team from the ARMY fandom community				
	Run Co-Design Camp to create the fandom escape room				
	Finalize the escape room generated by the Fandom co-design team				
Design the BLM Escape Room	Recruit the co-design team from the BLM community				
	Run Co-Design Camp to create the BLM escape room				
	Finalize the escape room generated by the BLM co-design team				
Activity #5: Evaluation	Produce interim and final outcome evaluation reports of Euphorigen				
	Produce findings from process evaluation of Co-Design Camp				
Activity #6: Final Dissemination of Resources	Produce the final Design Kit				
	Finalize implementation guide, video tutorial, webinar, and promotional materials				
	Undertake dissemination campaign with WebJunction				
Course	Run class (Directed Research Group) for student credit and participation in the project				
Advisory Board	Convene Advisory Board (September, January, April, July)				

Note: Shaded bars represent an activity's most intensive period; in practice, activities may begin before and extend beyond

DIGITAL PRODUCT FORM

INTRODUCTION

The Institute of Museum and Library Services (IMLS) is committed to expanding public access to digital products that are created using federal funds. This includes (1) digitized and born-digital content, resources, or assets; (2) software; and (3) research data (see below for more specific examples). Excluded are preliminary analyses, drafts of papers, plans for future research, peer-review assessments, and communications with colleagues.

The digital products you create with IMLS funding require effective stewardship to protect and enhance their value, and they should be freely and readily available for use and reuse by libraries, archives, museums, and the public. Because technology is dynamic and because we do not want to inhibit innovation, we do not want to prescribe set standards and practices that could become quickly outdated. Instead, we ask that you answer questions that address specific aspects of creating and managing digital products. Like all components of your IMLS application, your answers will be used by IMLS staff and by expert peer reviewers to evaluate your application, and they will be important in determining whether your project will be funded.

INSTRUCTIONS

If you propose to create digital products in the course of your IMLS-funded project, you must first provide answers to the questions in **SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS.** Then consider which of the following types of digital products you will create in your project, and complete each section of the form that is applicable.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

Complete this section if your project will create digital content, resources, or assets. These include both digitized and born-digital products created by individuals, project teams, or through community gatherings during your project. Examples include, but are not limited to, still images, audio files, moving images, microfilm, object inventories, object catalogs, artworks, books, posters, curricula, field books, maps, notebooks, scientific labels, metadata schema, charts, tables, drawings, workflows, and teacher toolkits. Your project may involve making these materials available through public or access-controlled websites, kiosks, or live or recorded programs.

SECTION III: SOFTWARE

Complete this section if your project will create software, including any source code, algorithms, applications, and digital tools plus the accompanying documentation created by you during your project.

SECTION IV: RESEARCH DATA

Complete this section if your project will create research data, including recorded factual information and supporting documentation, commonly accepted as relevant to validating research findings and to supporting scholarly publications.

SECTION I: INTELLECTUAL PROPERTY RIGHTS AND PERMISSIONS

A.1 We expect applicants seeking federal funds for developing or creating digital products to release these files under open-source licenses to maximize access and promote reuse. What will be the intellectual property status of the digital products (i.e., digital content, resources, or assets; software; research data) you intend to create? What ownership rights will your organization assert over the files you intend to create, and what conditions will you impose on their access and use? Who will hold the copyright(s)? Explain and justify your licensing selections. Identify and explain the license under which you will release the files (e.g., a non-restrictive license such as BSD, GNU, MIT, Creative Commons licenses; RightsStatements.org statements). Explain and justify any prohibitive terms or conditions of use or access, and detail how you will notify potential users about relevant terms and conditions.

The University of Washington (UW) will hold rights and ownership to the intellectual property resulting from this project. In line with IMLS and UW expectations for projects of this type, the escape room resources will be made freely available to libraries, archives and museums (LAMs) for educational purposes, and through those organizations, will benefit the general public. The PIs will explore licensing terms and options as the digital products are developed to be made available either for free or at small cost to LAMs. The cost is for hosting and maintenance costs, not for commercial gains. The PIs will work with the UW's tech transfer office, CoMotion, during the project period to determine specific licensing needs and design a license that will allow LAMs to access these digital products in order to create new escape rooms for upload to the project website upon review.

A.2 What ownership rights will your organization assert over the new digital products and what conditions will you impose on access and use? Explain and justify any terms of access and conditions of use and detail how you will notify potential users about relevant terms or conditions.

The University of Washington will hold rights and ownership to the resulting intellectual property. Access to the escape room materials referenced in A.1 above will be made freely available to LAMs through the project website (www.lokisloop.org) for educational purposes, thereby benefiting the general public. LAM project participants will be made aware of the terms and conditions for use and access during the project start-up phase. The PIs will notify future potential LAM organizational users of the escape rooms, design kit, and curriculum about the relevant terms and conditions via the project website.

A.3 If you will create any products that may involve privacy concerns, require obtaining permissions or rights, or raise any cultural sensitivities, describe the issues and how you plan to address them.

The PIs recognize that the project's Design Kit could be used to develop escape rooms that raise cultural sensitivities or even amplify misinformation. The University of Washington retains the right to not host an externally-developed escape room if it does not comply with the project's quality control criteria in order to ensure the integrity of the project and hosted products and to prevent misuse.

During the 1-year project period, we will be requesting consent to collect participant data through surveys and focus groups for evaluation purposes. No identifying information will be shared beyond the project team. Once the products are completed and made freely available for LAM usage, we plan to collect usage data from log files and make a voluntary survey available. No identifiable data will be collected in ongoing data collection.

SECTION II: DIGITAL CONTENT, RESOURCES, OR ASSETS

A.1 Describe the digital content, resources, or assets you will create or collect, the quantities of each type, and the format(s) you will use.

The Euphorigen Investigation, Fandom and BLM escape rooms: Three browser-based online escape rooms (websites to be hosted by the University of Washington).
Misinformation Room Design Kit: An online toolkit with the ability to create text, upload media, select and sequence puzzles, and create a narrative. Accessible through an access controlled web browser.
Misinformation Co-Design Camp curriculum: Text and media files assembled as a curriculum. Accessible through an access controlled website.
Project website: Loki's Loop (www.lokisloop.org) to host the openly available and access-controlled resources. Publications and other academic outputs will be hosted on the UW-supported websites of the Center for an Informed Public, Technology & Social Change Group, GAMER Research Group, and Information School

A.2 List the equipment, software, and supplies that you will use to create the digital content, resources, or assets, or the name of the service provider that will perform the work.

All the hardware and software necessary for the creation of this content will be provided by the UW Information School. The PIs and students assistants will be using workstations provided by the iSchool. The school licenses Microsoft Office products and Adobe Acrobat, which will be used to produce some resource materials. The web programming languages may also be accessed via UW licenses.

A.3 List all the digital file formats (e.g., XML, TIFF, MPEG, OBJ, DOC, PDF) you plan to use. If digitizing content, describe the quality standards (e.g., resolution, sampling rate, pixel dimensions) you will use for the files you will create.

We intend to use PNG, JPEG, and MPEG formats for all digital media. The DPI of all images will be the web standard 72dpi. JPEG format images will be used for photos and photo-like images. PNG format will be used for any other images. MPEG format will be used for video. For readable content we intend to use HTML to store and present our content. Additional outputs include: DOC, DOCX, PPT, PPTX, and PDF. Website support and guidance will be provided by UW's IT Services team to ensure quality standards are appropriate and that longevity and stability of file types are maximized.

Workflow and Asset Maintenance/Preservation

B.1 Describe your quality control plan. How will you monitor and evaluate your workflow and products?

The PIs will lead and manage the project; they will review all project products prior to release. The Center for an Informed Public's Senior Data Engineer will oversee all significant technical decisions and ensure that the digital products meet UW standards. Usability of the project website and products will be tested by project staff as well as library participants during development and upon launch/publication. The Advisory Board members will also review project outcomes during development and upon launch/publication and provide feedback.

B.2 Describe your plan for preserving and maintaining digital assets during and after the award period. Your plan should address storage systems, shared repositories, technical documentation, migration planning, and commitment of organizational funding for these purposes. Please note: You may charge the federal award before closeout for the costs of publication or sharing of research results if the costs are not incurred during the period of performance of the federal award (see 2 C.F.R. § 200.461).

All of our project materials will be stored and maintained during the project period on UW Information School-provided Google Team Drive (or similar product) that is FERPA compliant and provides appropriate access and control functions. UWIS provides technical support in conjunction with the UW IT group on an ongoing basis to project staff.
Long-term access to the escape room materials will be provided to LAMs through the project website (www.lokisloop.org). The Center for an Informed Public's Senior Data Engineer will provide long-term support for the maintenance and upkeep of the website and related resources.
Publications and other academic outputs will be hosted during the project and beyond on the UW-IT supported websites of the Center for an Informed Public, Technology & Social Change Group, GAMER Research Group, and Information School.

Metadata

C.1 Describe how you will produce any and all technical, descriptive, administrative, or preservation metadata or linked data. Specify which standards or data models you will use for the metadata structure (e.g., RDF, BIBFRAME, Dublin Core, Encoded Archival Description, PBCore, PREMIS) and metadata content (e.g., thesauri).

We will provide basic metadata tags for our materials on the project websites/resources to aid the searching and browsing of potential users. We will use Dublin Core for the metadata used on the project websites.

C.2 Explain your strategy for preserving and maintaining metadata created or collected during and after the award period of performance.

Metadata used on the websites and resources will be periodically reviewed by the PIs including at least annually after the grant period of performance, and will update terms and the metadata schema as needed to ensure the sites/resources continue to be useful and navigable.

C.3 Explain what metadata sharing and/or other strategies you will use to facilitate widespread discovery and use of the digital content, resources, or assets created during your project (e.g., an API [Application Programming Interface], contributions to a digital platform, or other ways you might enable batch queries and retrieval of metadata).

To support widespread discovery of the sites and the resources that we will be developing, we will integrate search engine optimization principles into the design.

Access and Use

D.1 Describe how you will make the digital content, resources, or assets available to the public. Include details such as the delivery strategy (e.g., openly available online, available to specified audiences) and underlying hardware/software platforms and infrastructure (e.g., specific digital repository software or leased services, accessibility via standard web browsers, requirements for special software tools in order to use the content, delivery enabled by IIIF specifications).

The University of Washington will make the escape rooms, the Design Kit, and the Co-Design Camp curriculum selectively available through an access-controlled website to LAM institutions. LAM institutions are free to use these assets for offering to the public. LAM users will need access to an internet connection and web browser.

Publications and other academic outputs will be hosted during the project and beyond on the UW-IT supported websites; users will need access to an internet connection, web browser, and a PDF viewer (or browser extension).

D.2. Provide the name(s) and URL(s) (Universal Resource Locator), DOI (Digital Object Identifier), or other persistent identifier for any examples of previous digital content, resources, or assets your organization has created.

Project website: www.lokisloop.org

SECTION III: SOFTWARE

General Information

A.1 Describe the software you intend to create, including a summary of the major functions it will perform and the intended primary audience(s) it will serve.

N/A

A.2 List other existing software that wholly or partially performs the same or similar functions, and explain how the software you intend to create is different, and justify why those differences are significant and necessary.

N/A

Technical Information

B.1 List the programming languages, platforms, frameworks, software, or other applications you will use to create your software and explain why you chose them.

N/A

B.2 Describe how the software you intend to create will extend or interoperate with relevant existing software.

N/A

B.3 Describe any underlying additional software or system dependencies necessary to run the software you intend to create.

N/A

B.4 Describe the processes you will use for development, documentation, and for maintaining and updating documentation for users of the software.

N/A

B.5 Provide the name(s), URL(s), and/or code repository locations for examples of any previous software your organization has created.

N/A

Access and Use

C.1 Describe how you will make the software and source code available to the public and/or its intended users.

N/A

C.2 Identify where you will deposit the source code for the software you intend to develop:

Name of publicly accessible source code repository:

N/A

URL:

N/A

SECTION IV: RESEARCH DATA

As part of the federal government's commitment to increase access to federally funded research data, Section IV represents the Data Management Plan (DMP) for research proposals and should reflect data management, dissemination, and preservation best practices in the applicant's area of research appropriate to the data that the project will generate.

A.1 Identify the type(s) of data you plan to collect or generate, and the purpose or intended use(s) to which you expect them to be put. Describe the method(s) you will use, the proposed scope and scale, and the approximate dates or intervals at which you will collect or generate data.

N/A

A.2 Does the proposed data collection or research activity require approval by any internal review panel or institutional review board (IRB)? If so, has the proposed research activity been approved? If not, what is your plan for securing approval?

N/A

A.3 Will you collect any sensitive information? This may include personally identifiable information (PII), confidential information (e.g., trade secrets), or proprietary information. If so, detail the specific steps you will take to protect the information while you prepare it for public release (e.g., anonymizing individual identifiers, data aggregation). If the data will not be released publicly, explain why the data cannot be shared due to the protection of privacy, confidentiality, security, intellectual property, and other rights or requirements.

N/A

A.4 What technical (hardware and/or software) requirements or dependencies would be necessary for understanding retrieving, displaying, processing, or otherwise reusing the data?

N/A

A.5 What documentation (e.g., consent agreements, data documentation, codebooks, metadata, and analytical and procedural information) will you capture or create along with the data? Where will the documentation be stored and in what format(s)? How will you permanently associate and manage the documentation with the data it describes to enable future reuse?

N/A

A.6 What is your plan for managing, disseminating, and preserving data after the completion of the award-funded project?

N/A

A.7 Identify where you will deposit the data:

Name of repository:

N/A

URL:

N/A

A.8 When and how frequently will you review this data management plan? How will the implementation be monitored?

N/A